

## PHYSICS

# Rockets Into Stratosphere Higher Than Balloons Can

Flights Leaving All Air Behind Planned By Scientist To Study Cosmic Rays and Heavieside Layer

Dr. R. H. Goddard, who has pioneered in rocket development for the past twenty years, is at Roswell, N. M., where he will resume experiments on high altitude rocket flights.

By **DR. R. H. GODDARD**, Professor of Physics, Clark University.

**D**EVELOPMENT of a rocket to reach high altitudes will be continued during the coming academic year at Roswell, New Mexico, under a grant from the Daniel and Florence Guggenheim Foundation. It is hoped that high flights with meteorological and other instruments will be obtained.

At the time the work was discontinued in 1932, short flights to study the performance of the rockets in the air and to develop the stabilizing devices had been made.

### Continued in the Laboratory

No flights have been possible during the past two years, but work has been continued along a number of lines in the laboratory at Clark University, under grants from the Smithsonian Institution and the Daniel and Florence Guggenheim Foundation. Investigations have been carried on regarding materials, methods of fabrication, tests of stabilizing means, and similar matters, which will make possible a considerable saving of time in the forthcoming tests.

Flights can not be resumed immediately, as the entire experiment plant at Roswell was dismantled in 1932, and must first be reassembled and put in working order.

### Will Go Higher Than Balloon

The importance of the work lies in the possibility of sending rockets equipped with recording instruments, or with instruments having short wave radio transmitters, to greater heights in the stratosphere than balloons can reach.

Such rockets will permit of more exact study of the ozone layer, which is believed to exist at an altitude of about 40 miles, and of the various so-called Appleton electrical layers of gas which

exist above the ozone layer for many miles, and which make radio broadcasting possible. There are many other investigations, notably in the field of cosmic ray research, which it is very desirable to have carried on at heights that are practically above the atmosphere.

It is likely that most of the measurements will be made either at the highest point of the ascent, or while the rocket is descending in a parachute.

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There are now so many moose on Isle Royale in Lake Superior, that it is reported these animals are eating up the scenic beauties of the island, and may presently eat themselves out of food.

## PHYSICS

# Next Radio Robot Balloon To Measure Cosmic Rays

By **PROF. ARTHUR H. COMPTON**, The University of Chicago.

**T**HE SUCCESS of the trial flight of our radio transmitting balloon has prepared us for the next stage where the intensity of the cosmic rays will also be recorded.

Our balloon which ascended at Chicago was filled with 250 cubic feet of hydrogen. It carried a barometer, radio transmitter and batteries weighing about eight pounds. After 31 minutes the balloon had risen to 9.5 miles as indicated by the radio record of the barometer. The barometer was adjusted to silence the radio signals at this altitude but the balloon was observed with telescope as it continued to climb for another half hour.

Sixty-two minutes after leaving the earth it was seen to burst at an estimat-



### COUNTERFEITING ZEUS

When lightning strikes dry sand, it fuses the particles into a many-branched tube known as a fulgurite. These lightning-stones are objects of superstitious awe in some parts of the world. The one shown here, however, is man-made: it was produced by a high-voltage electrical discharge into sand at the Pittsfield laboratory of the General Electric Company.

ed altitude of about 18 miles. Here the balloon must have been expanded to about 24 feet in diameter. No report of finding it has been received. The transmitter radiated about a half watt at 20 meters wavelength which was received without difficulty, even though, through an accident, half of the antenna was broken loose as the balloon left the ground.

The test showed the adequacy of our barometer and of the radio method of noting its readings. On this test flight, the relatively expensive cosmic ray meter was not sent up.

Two important advances in science's drive to solve the mystery of the cosmic rays are disclosed as one of the research leaders, Prof. Arthur H. Compton of the University of Chicago, is aboard ship en route across the Atlantic